

**THE EFFECT OF MOBILE BANKING ON THE FINANCIAL  
PERFORMANCE OF STOCK BROKERAGE FIRMS IN KENYA**

**MARY THUKU**

**A RESEARCH PROJECT PRESENTED IN PARTIAL FULLFILMENT OF THE  
REQUIREMENTS FOR THE AWARD OF THE DEGREE IN MASTERS OF  
BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF  
NAIROBI**

**NOVEMBER 2017**

## DECLARATION

I declare that this research project is my original work and my own effort and that it has not been submitted to any other institution of higher learning for any academic purposes

Signature ..... Date .....

Mary Thuku

D61/83973/2016

This project has been submitted for examination with the approval and advice as the university supervisor

Signature: .....Date: .....

Dr. Kennedy Okiro

## **DEDICATION**

I dedicate this research project to my family members and friends for their moral support and understanding whenever I stayed late to attend to assignments and develop the research.

## **ACKNOWLEDGEMENT**

My special gratitude goes to Almighty God for giving me the strength and wisdom to pursue this course.

I am very grateful to my supervisor Dr. Kennedy Okiro and Dr. Mirie Mwangi for the knowledge and skills they imparted in me throughout this project.

I must admit humbly that the success of this research has been largely due to collaborative efforts and devotion of many people to who I owe a lot of gratitude. This research would have not been completed without their ultimate support.

May God bless you all.

# TABLE OF CONTENT

<b>DECLARATION</b> .....	<b>ii</b>
<b>DEDICATION</b> .....	<b>iii</b>
<b>ACKNOWLEDGEMENT</b> .....	<b>iv</b>
<b>TABLE OF CONTENT</b> .....	<b>v</b>
<b>LIST OF ABBREVIATIONS</b> .....	<b>ix</b>
<b>LIST OF TABLES</b> .....	<b>x</b>
<b>LIST OF FIGURES</b> .....	<b>xi</b>
<b>ABSTRACT</b> .....	<b>xii</b>
<b>CHAPTER ONE: INTRODUCTION</b> .....	<b>1</b>
1.1 Background of the Study .....	1
1.1.1 Mobile Banking .....	3
1.1.2 Financial Performance of Stock Brokerage Firms .....	4
1.1.3 Mobile Banking and the Performance of Stock Brokerage Firms .....	5
1.1.4 Stock Brokerage Firms .....	6
1.2 Research Problem .....	7
1.3 Research Objective .....	9
1.4 Value of the Study .....	9

<b>CHAPTER TWO: LITERATURE REVIEW .....</b>	<b>11</b>
2.1 Introduction .....	11
2.2 Theoretical Foundation.....	11
2.2.1 Efficient Market Hypotheses .....	11
2.2.2 Financial Intermediation Theory.....	12
2.2.3 Market Power and Efficiency Structure Theory .....	13
2.2.4 Modern Economics Theory.....	14
2.3 Determinants of Financial Performance of Brokerage Firms.....	15
2.3.1 Local Market Conditions.....	15
2.3.2 Cost Efficiency .....	15
2.3.3 Global Economic Climate .....	16
2.3.4 Political Conditions .....	16
2.3.5 Firm Size .....	17
2.4 Empirical Literature Review .....	17
2.5 Conceptual Framework .....	20
2.6 Summary of Literature Review .....	21
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>23</b>
3.1 Introduction .....	23
3.2 Research Design .....	23
3.3 Population.....	23
3.4 Data Collection.....	24
3.5 Diagnostic Test.....	24

3.6 Data Analysis.....	24
3.7 Test of Significance.....	26
<b>CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS.....</b>	<b>27</b>
4.1 Introduction .....	27
4.1.1 Response Rate.....	27
4.1.2 Diagnostic Test .....	28
4.2 Descriptive Statistics .....	30
4.3 Correlation Analysis.....	31
4.4 Regression Analysis .....	34
4.5 Discussion of the Findings .....	38
<b>CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....</b>	<b>40</b>
5.1 Introduction .....	40
5.2 Summary of the Findings .....	40
5.2.1 Total Commission Volume Generated through Mobile Banking to Total Revenue of Market Participant .....	41
5.2.2 Number of Investors who traded via Brokers using Mobile Banking to Total Number of Traders who Trade through Market Participant .....	41
5.2.3 Volume of Trades Moved using Mobile Banking per Participant to Total Revenue Moved through all Trading Platforms.....	42
5.2.4 Firm Size or Firm Value .....	42
5.2.5 Operational Cost Efficiency.....	42

5.3 Conclusion.....	43
5.4 Recommendations of the Study.....	44
5.5 Limitations of the Study .....	44
5.6 Suggestions for Further Research.....	45
<b>REFERENCES .....</b>	<b>46</b>
<b>APPENDIX I: LIST OF LICENSED MARKET PARTICIPANTS .....</b>	<b>50</b>
<b>APPENDIX II: DATA FOR THE STUDY .....</b>	<b>52</b>



## **LIST OF ABBREVIATIONS**

<b>BOD</b>	-Board of Directors
<b>CBK</b>	-Central Bank of Kenya
<b>CMA</b>	-Capital Markets Authority
<b>NSE</b>	-Nairobi Securities Exchange
<b>EMH</b>	-Efficient Market Hypothesis

## LIST OF TABLES

Table 4.1: Diagnostic Test.....	29
Table 4.2: Descriptive Statistics .....	30
Table 4.3: Correlation Analysis.....	32
Table 4.4: Model Summary .....	34
Table 4.5: ANOVA .....	35
Table 4. 6: Regression Coefficients.....	36

## LIST OF FIGURES

Figure 2.1: Conceptual Framework.....	21
Figure 4.1: Response Rate.....	28

## ABSTRACT

The main objective of this study was to examine the impact of mobile banking on the performance of stock brokerage firms in Kenya. The study employed a descriptive research analysis. The population was 25 market participants in Kenya. The data that was used in the study was secondary collected using a data collection tool. A multiple regression analysis was applied in the data analysis in order to establish the nature of the relationship between mobile banking and the performance of brokerage firms in Kenya. From the findings, total commission to total market revenue had Pearson correlation  $r=0.507$ ,  $p=0.000<0.05$ , the number of investors to total traders had  $r=0.320$ ,  $p=0.002$ ; volume of trade to total revenue had  $r=-0.869$ ,  $p=0.000$ ; firm size had an  $r=0.552$ ,  $p=0.000$  and operational cost efficiency had an  $r=-0.156$ ,  $p=0.130$ . The study concludes that total commission volumes generated through mobile banking to total revenue of market participant significantly affects performance of stock brokerage firms, the number of investors who traded via brokers using mobile banking to total number of traders who trade through market participant is a significant predictor of performance of stock brokerage firms, volumes of trades moved using mobile banking per participant to total revenue moved through all trading platforms is a significant predictor of performance of stock brokerage firms, firm size had significant effect on performance of stock brokerage firms, operational cost efficiency was a significant determinant of performance of stock brokerage firms. The findings of the study was that total revenue generated through mobile banking had a positive significant effect on the performance, the number of investors who traded through mobile banking had a moderate effect on the performance, volumes of trade moved through mobile banking had a positive effect on performance, firm size had a positive effect on performance and operational cost efficiency had a positive effect as per regression analysis but was insignificant as per the probability values generated from testing the correlation analysis. The study recommends that the top management of all stock brokerage firms operating in Kenya should come up with sustainable strategies geared towards growing of the total commission volumes generated through mobile banking and total revenue of market participant. Management of NSE should create awareness among market participants including investors to leverage on mobile banking in carrying out their transactions and this will enhance performance of stock brokerage firms. Capital Market Authority CMA in conjunction with the Central Bank of Kenya and Telecommunication firms like Safaricom need to cooperate in formulation of sound policies and regulations that shall grow volumes of trades moved using mobile banking per participant and total revenue moved through all trading platforms and this shall enhances performance of stock brokerage firms. Stock brokerage firms need to align their growth strategy with the overall strategic goals of their organization in order to increase their sizes and this improves performance. Top management of all stock brokerage firms and all firms generally operating in Kenya and investors should adopt technology for example m-banking in carrying out their operations.

# **CHAPTER ONE: INTRODUCTION**

## **1.1 Background of the Study**

Stock brokerage firms whom are also known as stock brokers or share brokers are charged with the duty of facilitating the buying and selling of shares in the Nairobi Securities Exchange. They are licensed by the Capital Markets Authority. Their main source of revenue is the commission they collect from facilitating trades. Traders or investors have to buy and sell shares through the trading participants, in this way they charge a fee for facilitating the trades (NSE, 2017). This fee is known as brokerage commission and is the biggest source of revenue for a trading participant or a broker.

Recent development in the financial industry has seen the emergence of mobile handsets as a tool of trading in securities listed in the Nairobi Securities Exchange. Investors are able to put buy and sell orders of securities from the convenience of their mobile phones (Nicoletti, 2014). This is possible only through using an application that interfaces the investor with the stock broker and therefore enables the investor to trade through the stock brokerage firm by using their mobile phones. Technological advancement and the emergence of mobile phone applications has strengthened the mobile handsets from being only communication tools (Sales, 2003). Mobile phones have in recent times emerged as banking and saving platforms apart from being communicating gadgets. This advancement has seen them evolve into trading platforms and stock brokerage firms have taken the opportunity to apply the technology in order to enable their client's trade from the comfort of their mobile phones (Norman, 2002).

Theoretically there is literature both theoretical and empirical which try to explain the impact of mobile banking on the financial performance of the trading participants. The Efficient Market Hypothesis, the financial intermediation theory, the market power and modern economics theory both try to explain the effect of increased efficiency on the financial performance of entities (NSE, 2017). There are researchers who have attempted to explain the relationship between mobile banking and the performance of brokerage firms and other trading entities. Some have carried out an empirical research and majority has concluded the relationship is positive. This means that there is a positive impact that mobile banking has on the performance of trading entities and the same should apply to brokerage firms (Laudon & Traver, 2013).

Scholars have put down literature in the form of theories that also guide on what the impact mobile banking would have on the performance of brokerage firms or any other trading entity in general. The theories of financial intermediation, efficient market hypothesis, market power and modern economic theories attempt to illustrate how efficiencies brought about by mobile banking would have an effect on the performance of trading entities (Kaplow, 2015). The theories in a way imply that anything that promotes efficiency like what mobile banking would do will have a positive impact on the performance of trading entities. This means that it is expected that trading entities and brokerage firms' performance will be boosted by mobile banking.

There are 24 licensed brokerage firms in Kenya. Their work is to facilitate the selling and buying of shares in the NSE. They enable buyers buy securities and sellers sell securities at a fee known as brokerage commissions. The firms have started putting into place

technology that will allow investors to trade through them by use of a mobile phone handset (Kiarie & Minja, 2014). This is in an effort to promote efficiency and convenience on the part of the investor in order to spur more activity and improve on the brokers earnings as a result of the commission generated by high turnover volumes.

### **1.1.1 Mobile Banking**

Mobile banking is the application of mobile phone technology to perform financial services through the use of a mobile phone. The same can be done using instructions known as USSD or by use of an application on a smart phone. It started in the form of Mobile Money Transfers where telecommunications companies started by making it possible for mobile phone users to transfer funds to one other and accessing the same by the use of agents who were strategically located (Bernardo, 2014).

Commercial banks sensing that they were being rivalled strategically positioned themselves to work hand in hand with the telecommunication money transfer platforms (Marketline, 2014). This gave rise to Mobile Banking where clients apart from being able to transfer funds to their bank accounts from the mobile money platforms could now operate their bank accounts through the use of their mobile phones. Majority if not all of the financial institutions including brokerage firms spotted the opportunity and decided to integrate in order to enable their clients transact from the comfort of their mobile phones (Nicoletti, Mobile banking : evolution or revolution?, 2014). Brokerage firms enabled clients to fund their accounts with the firms by use of mobile money platforms like Safaricom M-Pesa and Airtel Money. It also goes further as enabling them to place

transactional orders and track the performance of their portfolio of securities from their mobile phones.

### **1.1.2 Financial Performance of Stock Brokerage Firms**

Financial performance is essentially determined by the difference between the income you generated and the expenses you incurred. The higher the income compared to the expenses the higher the performance. Performance will only be positive when an entity engages in ways that will increase its level of income for a certain level of expenditure. Stock brokerage firms engage in ways of increasing financial performance as it is the key aspect of the firm's survival(Elliott, 2017).

The main revenue source for stock brokerage firms are commissions charged on volumes of traded shares that have been transacted through a broker (Weiss Ratings, 2001). The higher the volume, the higher the revenue in the form of brokerage commission. The price of the securities being traded through a broker also determines the value of the commission (Palepu, Healy, & Peek, 2016). The higher the price, the higher the commission and vice versa. Brokerage firm's performance is also synonymous to the performance of the economy (Weiss Ratings, 2001). A positive growth in the economy is usually accompanied by investors trading robustly in the securities exchange.

By adopting technology and corporate governance principles, brokers have been able to improve their operational and informational efficiencies and thereby boosting their performance. They also have other income avenues like doing research and analysis on behalf of investors for a fee (Sales, 2003).



Brokerage firms also perform other consultancy services apart from doing specifically brokerage alone. They also offer analysis to assist their clients when making investment decisions. Investors can even subscribe to newsletters which will be then charged at a fee in order to get a wider view of information from their brokers (NSE, 2017). They also offer advice and consultancy to companies who have the plan of listing their shares to the public in the NSE. These are other forms of income that brokerage firms are able to generate apart from their mainstream brokerage commission generated from the facilitation of the sale of securities in the NSE.

### **1.1.3 Mobile Banking and the Performance of Stock Brokerage Firms**

Since the onset of mobile banking technology into the trading space of the securities exchange through the facilitation of stock brokers, researchers are trying to decipher the impact of the technology on the performance of trading firms. There are quite a number of variables which determine the volumes that are traded on the securities exchange (Elliott, 2017). Mobile banking has initiated an electronic link between the stock brokers and investors. In the global setting investors were able to ordinarily issue trading instructions through a telephone call or from the comfort of a computer.

The mobile phone has become a very powerful tool in Kenya. Majority of the population find it easy to use and understand when trading using the mobile phone. The technology and simple user interface that is graphical by design has made it easy even for someone with little education to understand how to use a mobile phone (Shneiderman, Plaisant, Cohen, Jacobs, & Elmqvist, 2017).

It has also created convenience to traders by enabling them to easily transact their business without going to a place physically. Investors are now able to furnish funds to their brokerage accounts, purchase securities and make payments and to also sell securities and receive payments from the comfort of their mobile phones. The application of technology and the use of mobile phones has tremendously reduced the turnaround time when it comes to trading in the NSE. Exchange of Shares and valuing of payments has greatly improved and the efficiencies lead to a spur in the economy (NSE, 2017).

The bottom line is that mobile banking is expected to have a significant impact on the performance of stock brokerage firms in Kenya. This research paper will aim to decipher the extent of the relationship and the significance of the impact of mobile banking on the performance of stock brokerage firms or the market participants (Labonne, Chase, & Bank, 2009).

#### **1.1.4 Stock Brokerage Firms**

A stock brokerage is an entity that facilitates the transfer of securities through a trade from the selling party to the buying party. They are created by CAP 485 of the Capital Markets Act. They are regulated by the Capital Markets Authority and facilitate transactions in the Nairobi Securities Exchange which the market for the traded securities. Brokerage firms generate income or revenue from facilitation of trades in the security exchange (Mayer, 1992). Larger volumes and larger values of trades increase the value of brokerage commission being collected. Therefore anything that spurs the performance of trading in the market is advantageous to the performance of brokerage firms.

There are currently 24 licensed stock brokerage firms in Kenya. Majority of the participants have interfaced with the NSE using an application known as an API and are able to electronically communicate and enable investors to transact electronically (Labonne, Chase, & Bank, 2009). This has improved both the operational and informational efficiencies when it comes to trading in shares of companies listed in the Nairobi Securities Exchange. The Nairobi Securities Exchange upgraded its trading platform in order to improve of the efficiency of trading in the market (NSE, 2017). This has increased the speed with which investors can trade and get information on securities listed through their brokers.

For one to do brokerage business, an entity has to be licensed by the Capital Markets Authority. There certain requirements that have to be met for one to be licensed to carry on the business of stock broking. The requirements include items such as the liquid capital base, qualification of the employees of the firm, the firm has to fulfill registration requirements for companies in Kenya (Capital Markets Authority, 2017). This is just but a summary of the many requirements a firm has to fulfill before being registered as stock broker.

## **1.2 Research Problem**

The conceptual framework illustrates that mobile banking has been explained various researchers as to have an impact on the efficiency of transactions being carried out by institutions. Researchers have concluded in their studies that mobile banking increases the efficiency and convenience with which transactions take place. The research is about the impact of the same on the performance of stock brokerage firms in Kenya (Bernardo,

2014). Some scholars have also given situations where mobile banking may impact the performance of trading entities negatively especially in an environment that is not stable and has system downtimes and poor technological infrastructure.

Stock brokerages are created by the Capital Markets Act Cap 485, laws of Kenya. They are regulated by CMA and work under CMA rules and also the NSE rules. Market participants are licensed to offer stock brokerage services to share investors. When investors purchase shares or sell them at the Nairobi Securities Exchange using their mobile phones; technically they are not transacting but issuing instructions to the broker on the securities to buy or sell on their behalf (Kulkarni, 1988). This means that the mobile phone is just a tool for issuing electronic instructions to the stock brokers who will in turn perform the trades as per the instructions.

The research gap that still exists is that no one has been able to come with a procedure on how well mobile banking and mobile phones can be used to harness the performance trading entities and stock brokers included(NSE, 2017). Researchers have only worked on establishing the existing relationship between mobile banking and performance. They have made conclusions on the same but still the question is how mobile banking can be used to enhance the performance of stock brokers? Empirical studies earlier carried by researchers both locally and internationally also suggest that the relationship between mobile banking and the performance of stock brokerage firms is a positive relationship. This means that mobile banking is expected to boost financial performance.

In Kenya mobile phones is not only a tool of communication but has also enabled financial sector deepening and financial inclusion. The mobile phone has become a great tool that has enabled people to save, bank and participate in investments that were termed as complicated and far reaching for the ordinary Kenyan citizen.(Mishkin & Serletis, 2016)

It also elicits in this area is how mobile phone technology can be harnessed to efficiently facilitate the trading of securities and hence spur the market for a better growth of the economy. This research paper aimed to assess the impact of mobile banking on the performance of brokerage firms and hence open up avenues for more research (Ratner & Healey, 1999). The research question then was what is the effect of mobile banking on the financial performance of stock brokerage firms in Kenya?

### **1.3 Research Objective**

The objective of the research was to determine the impact of mobile banking on the performance of stock brokerage firms in Kenya.

### **1.4 Value of the Study**

The research was intended to establish more ways in which mobile technology can be harnessed to bolster the volumes of trade in the securities exchange with an aim to improve on the performance of stock brokers. This would also spur the performance of the market and will have an impact on the economy (Alford & (GB), 1975).

The research was also expected to spur other researchers in the same field or similar fields to enable them improve on how mobile banking solutions can be harnessed to help improve the performance of stock brokerage firms and other financial institutions (NSE, 2017).

Finally the research would enable us understand the significance of the impact of mobile banking on the performance of stock brokerage firms. This would act as an eye opener when we understand the impact and would also enable the harnessing of the capacity of mobile banking to other sectors of the economy. This would enable improve efficiencies of transactions and further technological integration would enable end to end integration that will enhance speed and transparency (Kiarie & Minja, 2014).

The study would in theory help spur the enhancement of knowledge on how to effectively enhance the benefits of mobile banking in a way that would boost the performance of trading entities. The application of the knowledge generated by the research work would be able to help improve on the performance of the trading entities which would in aggregate boost the performance of the economy as a whole (Kiarie & Minja, 2014).

The expected beneficiaries of the study are the investors the stock brokerage firms, listed companies and the government. For the investors the study looked at avenues using mobile banking increases their convenience and boosts their capacity to invest comfortably. For the stock brokers the research sought to establish the most efficient ways mobile banking can be applied to enhance the financial performance of brokerage firms. For the government the study looked at establishing how mobile banking can be used to spur economic activity locally and boost national savings through local investments (NSE, 2017).

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter reviews literature brought forward by various scholars in the field of finance that have an effect on the research topic. The chapter looks at the theories brought forward and the empirical evidence taken from research work carried by scholars who tested data collected in a format that was to bring a conclusion on an issue ((U.S.), 1986).

### **2.2 Theoretical Foundation**

The theories to be looked at in this area are theories that are associated with market efficiencies and transactional efficiencies. These theories were postulated by scholars and postulate written but not empirically tested literature that try to give knowledge on the topic under research. The theories have been expressed below:

#### **2.2.1 Efficient Market Hypotheses**

The efficient market hypothesis, whose acronym is EMH, was proposed by Fama (1970). The theory is based on assumptions and states that the value of an asset represents all the information pertinent to the asset. The theory is based on the assumptions that the market is perfect; where there exists a large number of investors who analyze assets in an effort to make a gain, information is disseminated in the market in a random fashion and independently, prices of securities change as per new information quickly, and that security prices reflect all information (Read, 2013).

The EMH theory is important in this study because it shows how the situation would be if the market was perfect. That means that the stock brokerage firms would not be needed to

facilitate trades and advise clients because information is symmetrically disseminated in the market (Read, 2013).

### **2.2.2 Financial Intermediation Theory**

There are two theories of financial intermediation; we have the Modern Theory of Financial Intermediation and the Traditional Theory of Financial Intermediation. The Traditional Theory deals with financial costs and asymmetric information. Traditionally only a few group of people or experts had information or were only able to access certain information that is crucial in the market (Greenbaum, Thakor, & Boot, 2016). This clique of individuals is the ones who had the capacity to transact on behalf of the others and were therefore known as intermediators. In this theory, it is believed that information efficiency in the market is at a weak level. This is the reason why traders need to be aided by intermediaries to enable them complete their trades. Intermediaries may signal the hidden information they have to investors by taking up some shares in the security exchange. This information will make investors take the same position as the intermediaries. If intermediaries are well diversified and spread they serve the function of agents who are delegated in the presence of reputational penalties (Greenbaum, Thakor, & Boot, 2016).

The financial intermediation theory is important for this research as it guides and gives the reasons to which intermediaries are needed in a market. It talks about the inefficiencies of a market that leads to the need of a financial intermediary in order for the market to operate. Stock brokerage firms are financial intermediaries and are needed to help complete transactions and to avail private information to investors (Demirgüç-Kunt & Levine, 1993).



### **2.2.3 Market Power and Efficiency Structure Theory**

It is the capacity of a firm to profitably increase the price of a commodity over its marginal cost. In a market that is perfect, no competitor has market power. This means that all participants have all the information in the market and none can beat the others by using information to strategize. Market power can also be termed as the capability of a company to manipulate the price, or the supply of a commodity in the market (Kaplow, 2015). The company may be manipulate either the price alone or the supply alone or both of the factors at the same time. Companies which are said to have market power are known as price makers. This is because they can manipulate the prices of commodities or services in the market without affecting their level of market share. Theoretically market power cannot be possible in a perfect competitive market. This is because there are many competitors and information is freely available to each at the same time. It can only exist in imperfect markets like a monopolistic kind of market (Kaplow, 2015).

Companies which operate in a monopolistic market have the power to influence price and supply of commodities. In Kenya most of these firms are utility firms like Kenya Power and Lighting Company. In such a circumstance the Government has to come in and impose measures to control the pricing so that the same firms do not end up taking advantage of consumers for their own gains. The Government will limit the price through measures known as price controls, where they use mechanisms to limit the highest price that such companies can charge consumers (Kaplow, 2015).

Market Power theory is important to this study because it shows that an efficient participant with a big customer base and a high financial strength will be able to manipulate the market by either lowering or raising the brokerage fees in an attempt to shake the market in his favor. Brokerage firms in the past before the application and the development of strict regulations used to bully one another on such fronts and it was unhealthy for business as it destroyed other entities ability to compete (Kaplow, 2015).

#### **2.2.4 Modern Economics Theory**

Modern economic theory looks beyond classical theories. It looks beyond the source of production but also looks at items such as demand and supply, money supply and the impact of these factors on the effect of the growth of the economy and free trade (Leiter, 1977). Money supply economics which comes from modern economic theory talks about factors such as interest rates and inflation which affect the demand and supply of securities in the market therefore having an impact on the performance of stock brokers (Leiter, 1977). Open Market and free trade for example the free trade through the market participants or brokers in the securities exchange. The theory has an influence on the performance of the market.

Modern economics theory is important in the study as it talks about taking note on most of the aspects of the market and not only on traditional aspects. Stock brokerage firms should be able to analyze and forecast the movement of the market in an attempt to gauge the trends in demand and supply. This will enable them advice clients accordingly and also help in developing strategies while budgeting for a financial year (Leiter, 1977).

## **2.3 Determinants of Financial Performance of Brokerage Firms**

### **2.3.1 Local Market Conditions**

Market volatilities, interest rate regimes and inflation play a role in influencing the money supply in an economy. High interest rate regimes usually influence a low supply of money in the economy and this leads to low demand for securities by investors. This in turn reduces volumes of trade and reduces commission earned by brokers in the securities exchange.

Low inflation rates and low interest rate regimes usually influence a high supply of money in the economy leading to a high demand for shares and this increase the volume of securities (Shiller, 2001). This will in turn influence a high commission for the participants and this boosts his performance.

### **2.3.2 Cost Efficiency**

The efficiency with which market participants operate in terms of cost saving and good information systems in the application of technology. This increase in efficiency saves costs and increases the speed of operating therefore increasing performance by brokerage firms (Cornuejols & Tütüncü, 2007).

A participant who makes good use of technology and operated in a lean way in order to curb the rising levels of expenses will perform better financially than one who has a higher operating cost. Employing technology leads to limiting of costs such as transport and communication costs and also saves on time. This added efficiencies will promote a positive performance (Cornuejols & Tütüncü, 2007).

### **2.3.3 Global Economic Climate**

The global economic climate influences the economy of the country. This is because Kenya is a big importer of commodities. Also there are foreigners who invest in the local market and a poor performance of the foreign market has a significant influence on the performance of the local market (Shiller, 2001).

The global recession of 2008 dampened the world economy and Kenya was also heavily affected. Share prices in the NSE tumbled to record low levels. This led to a lower demand of shares as the world was grappling with a shortage of liquidity among investors and increased levels of debt. This led to a reduction in the activity in the NSE and as a result a reduction in the brokerage commission earned by market participants (NSE, 2017).

### **2.3.4 Political Conditions**

The political climate has an influence in the economy and may give confidence or lead to a loss of confidence by investors depending on the political risk being presented by a country. For example the post-election violence of 2007 led to a degradation of the economy and a drop in the performance of the securities exchange. This will have an effect on the performance of brokerage firms (Kettis & institutionen, 2004).

The post-election violence of the year 2007 to 2008 that was as a result of the presidential election of 2007 posed a significant political risk to the nation. The violence led to investors seeking to put their funds in Kenya seeking investments in other countries as the Kenyan market was seen as volatile. This led to a reduction in the activity of the NSE and

thus led to a drop in brokerage commission to market participants (Kettis & institutionen, 2004).

### **2.3.5 Firm Size**

The size of a firm may have an influence of the economies of scale. Larger firms may find it easier and efficient in operations due to economies of scale or the fact that they can increase operations at a higher rate compared to how operating expenses rise to a certain production level. Larger firms may therefore have an added advantage over small firms to certain levels of operations (Knight, 1972).

## **2.4 Empirical Literature Review**

Tchouassi, (2012) carried out a research to discover whether mobile banking extends banking services to those who are not directly in contact with commercial banks in sub-Saharan Africa. He also looked at the possibility of the same being extended to those with low earnings in the society. The study noted that low income earners in SSA lacked bank accounts and found it easier to transact using the mobile phone because of its convenience and solves the problem of travelling hundreds of kilometers to an urban center in search of a commercial bank. The same application is expected on the part of making brokerage services available to consumers.

Ching et al (2011) undertook a study on the factors that have an impact on Malaysian mobile banking inauguration by performing an empirical research. The study was done to promote the adoption of technology in the Malaysian nation. More specifically, the objective of the study was to look into the convenience that would be brought about by the

adoption of mobile banking technology. The conclusion was that mobile banking was a value addition tool as it promoted convenience and efficiency in the banking sector.

Donner and Tellez (2008) did a study on mobile banking and economic development where they sought to link adoption, impact, and use. The study established that through offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, m-banking/m-payments systems could prove to be an important innovation for the developing world. However, the true measure of that importance required multiple studies using multiple methodologies and multiple theoretical perspectives before answering the questions about adoption and impact.

Al-Jabri (2012) studied mobile banking adoption by looking at the application of diffusion of innovation theory. This study sought to investigate a set of technical attributes and how they influence mobile banking adoption in a developing nation, like Saudi Arabia. The study used diffusion of innovation as a base-line theory to investigate factors that may influence mobile banking adoption and use. More specifically, the objective of this research was to examine the potential facilitators and inhibitors of mobile banking adoption. The study was guided by six hypothesis including: relative advantage having a positive effect on mobile banking adoption; Complexity having a negative effect on mobile banking adoption; Compatibility having a positive effect on mobile banking adoption; Observability having a positive effect on mobile banking adoption; Trial ability having a positive effect on mobile banking adoption; and perceived risk having a negative effect on mobile banking adoption.

According to Koivu (2002) uptake of mobile phone in Kenya has been unprecedented. Mobile banking in Kenya affects performance of organization, behavior and decision making of the entire economy. The trend of continued reliance on mobile devices to execute monetary transaction is steadily gaining momentum. Mobile banking is one innovation which has progressively rendered itself in pervasive ways of cutting across numerous sectors of economy and industry.

Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by the banks because of the then small mobile banking customer base. Kigen (2010) sought to determine the impact that mobile banking bore on transactional costs of microfinance institutions.

Kingoo (2011) studied the relationship between electronic banking and financial performance of commercial banks in Kenya where he paid keen attention on the microfinance Institutions in Nairobi. Kingoo (2011) looked at the wider electronic banking whereas this study will only concentrate on mobile banking.

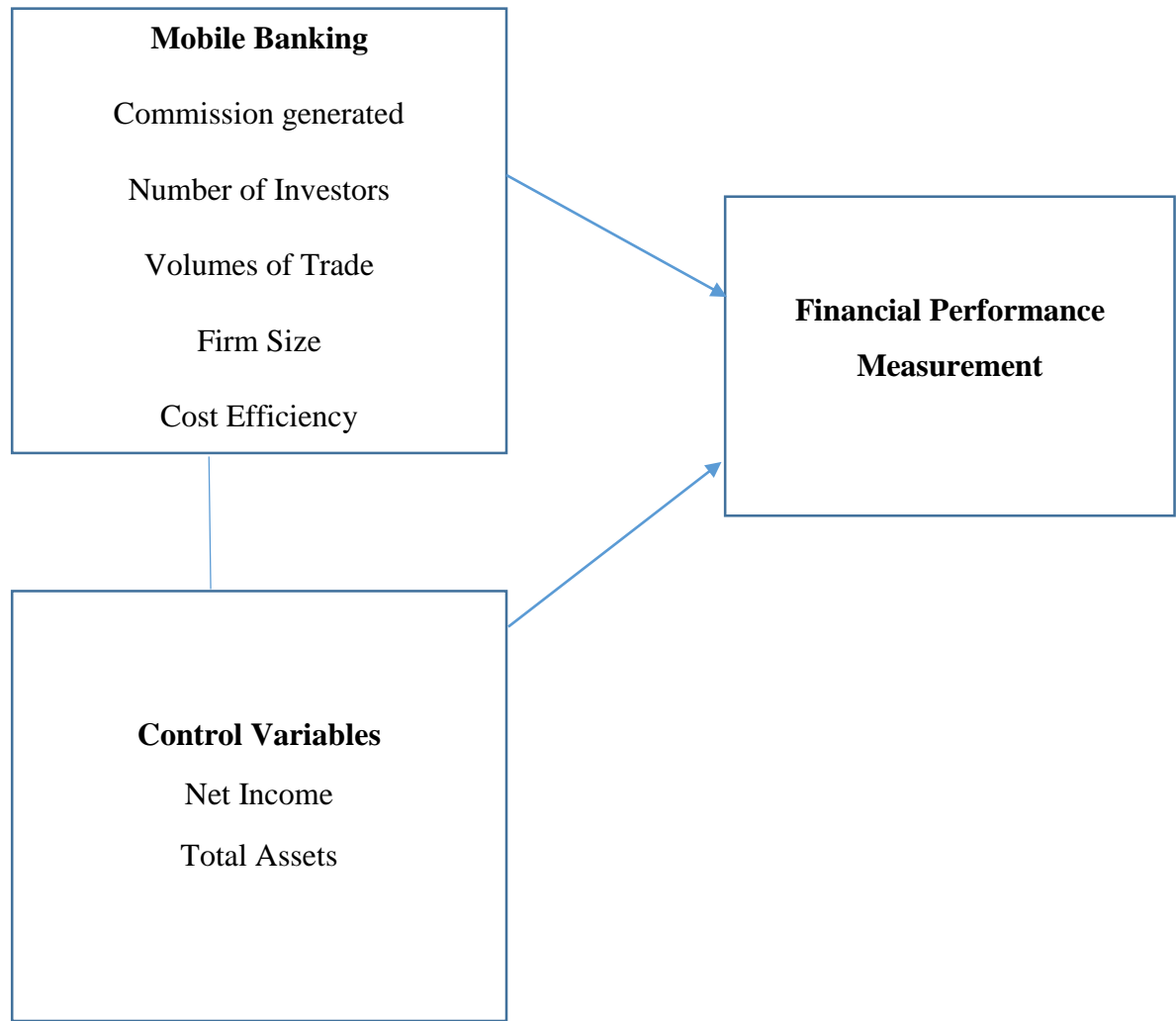
Zimmerman (2010) discovered that mobile banking in developing world was an object of skepticism among financial insiders while proponents argued that cell phones could revolutionize personal finance in poorer country, regulators warned of money laundering and most bankers worried that low customer balances wouldn't be worth transaction costs. From the above discussion of empirical literature, this study hypothesizes that mobile banking supports the delivery of mobile banking services in an economy.

## **2.5 Conceptual Framework**

Most researchers have conceptualized the impact of mobile banking on the performance of market participants and other trading entities. Most empirical researchers have concluded that mobile banking has a positive impact on the performance of brokerage firms and other trading entities. Researchers have concluded that mobile banking has increased the level of efficiency in trading entities and has boosted the performance of stock brokers (Berger & Udell, 2005).



## Conceptual Framework Diagram



**Figure 2.1: Conceptual Framework**

### 2.6 Summary of Literature Review

The literature review both theoretical framework and empirical review have all attempted to link either directly or through an existing processes the effect of mobile banking on the performance of market participants and other transacting entities. They have explained and

concluded that there is a significant effect on the performance of such entities when they allow clients or customers to be able to transact using their mobile phone handsets.

Majority of the researchers and scholars have concluded that the impact is positive and promotes the business as it leads to an increase in the volume of processing transactions. The researchers have researched both globally and locally.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

In this chapter the researcher discusses the model of the research design, the population and the sample that was statistically extracted from the population. The chapter covers the size of the sample the data collection mechanism and the tools that were used in the data collection. It also covers the design of the analytical procedure that were used to test the data collected (Blumberg, Cooper, & Schindler, 2014). The chapter illustrates the methods of testing the significance of the analysis that was employed.

### **3.2 Research Design**

The Design of the research employed a descriptive research analysis. A descriptive research analysis is a systematic, empirical enquiry in which the researcher has little or no direct control of the independent variables. Descriptive research design was suitable for the study as it enabled the establishment the relationship between mobile banking and the performance of market participants (Bickman, 2000).

### **3.3 Population**

The population is the total number of entities about which information is desired. A sample is the representative of the population that has been statistically extracted from it. For the study under review there are only 25 market participants in Kenya (Appendix). A census is the situation whereby data from the whole population under the study was analyzed in order to generate a result for the report (Scheaffer, 2012).

### **3.4 Data Collection**

The data that was used in the study was secondary. Secondary data was collected using a data collection tool that a copy was included in the appendix (Booz & Support, 1985). The data to be analyzed was collected from published reports of the brokerage firms for the five year period between 2012 and 2016.

### **3.5 Diagnostic Test**

The data needs to have all the attributes of data that is needed for a statistical analysis. The data need to be accurate, measurable quantitatively; collected using a well-defined systematic procedure and the data must be for the purpose it is intended to serve. Various diagnostic tests at this level were done on the proposed tool of data collection which was subjected for review by a supervisor and a moderator before it is approved for the study. The collection tool must show that data was collected as per the statistical requirement of data collection (Bickman, 2000). The tests of normality were applied to determine how the data is distributed. Skewness test SK2 and Kurtosis was used to determine the nature of distribution.

### **3.6 Data Analysis**

A multiple regression analysis was applied in the data analysis in order to establish the nature of the relationship between mobile banking and the performance of brokerage firms in Kenya. The Pearson Correlation coefficient analysis was used to test the strength of the relationship between Mobile banking and the performance of brokerage firms for the years under review (Ryan, 2009).

The study employed the Return on Assets as a measure of financial performance, and the total operating cost as the independent variable. The regression analysis is characterized by the below formula:

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \varepsilon_t$$

Where

Y= is the Financial Performance of brokerage firms

$$Y_t(ROA) = \frac{Net\ Income_t}{Total\ Assets_t}$$

$\alpha$ = is a constant value

$X_1$ = Total Commission volume generated through mobile banking, divided by the total revenue of the market participant

$X_2$ = Number of investors who traded via brokers using mobile banking, divided by the total number of traders who trade through the market participant

$X_3$ = volume of trades moved using mobile banking per participant divided by the total revenue moved through all the trading platforms

$X_4$ = the firm size or firm value taken as the price to earnings ratio of the firm

$X_5$ = the operational cost efficiency taken as the gross margin

$\beta$ = is the coefficient of the variables

### **3.7 Test of Significance**

An analysis on the variance was used to measure the significance of the model in carrying out the analysis. The study was carried out at 5% significant level. The coefficient of determination was used to determine the strength of the regression model or the relationship between the variables. The ANOVA or analysis of variance test was used to check for any difference or similarities between the variables in the study (Bickman, 2000).

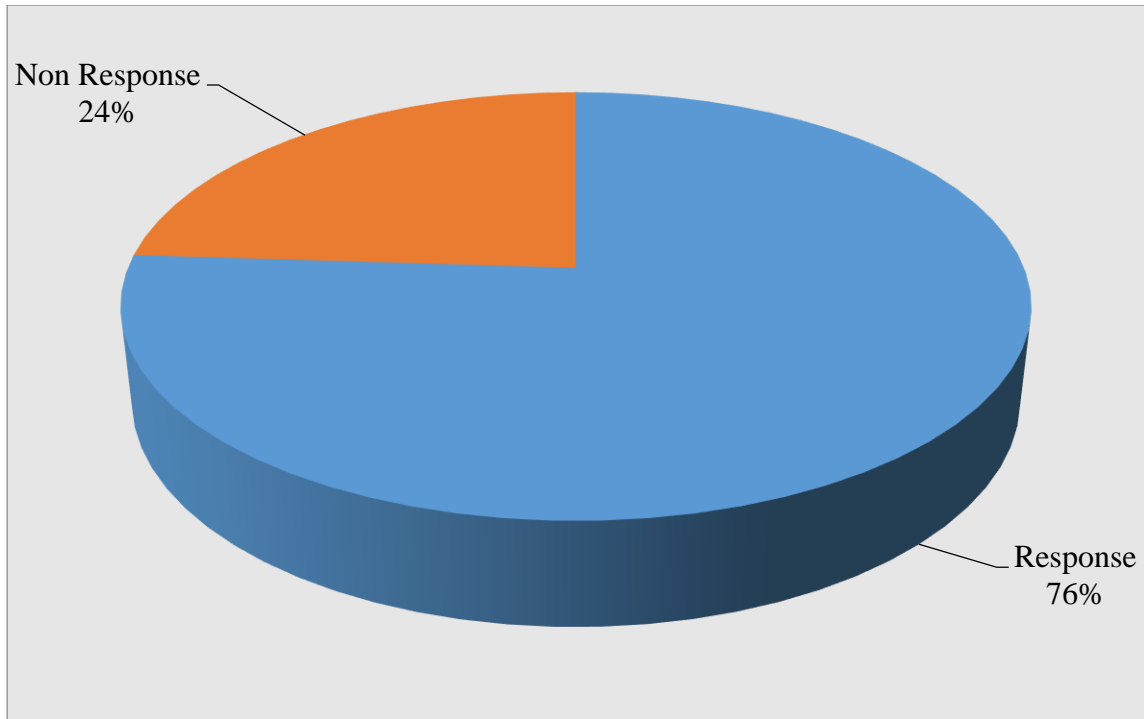
## **CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS**

### **4.1 Introduction**

The researcher presents the analysis of the collected data in this chapter. The study relied solely on secondary collected using data collection sheet. The collected data was cleaned, sorted and coded into SPSS software. Both descriptive and inferential statistics were used in analysis. The findings were presented using Tables and Figures where appropriate.

#### **4.1.1 Response Rate**

The researcher targeted 25 stock brokerage firms in Kenya as attached on Appendix one on a period of 5 years (2012-2016). This indicates that N was 125. However, data in some of these firms could not be established while other firms had few years of operations and this reduced the response rate. Out of 25 stock brokerage firms targeted by the researcher (N=125), the researcher managed to collect data from 19 firms (19X5) i.e. 95. This gave a response rate of 76%.



**Figure 4.1: Response Rate**

This response was good enough and representative of the population and conforms to Mugenda and Mugenda (2003) stipulation that a response rate of 70% and above is excellent.

#### **4.1.2 Diagnostic Test**

The researcher conducted normality test using Skewness and Kurtosis. The findings are indicated in Table 4.1.



**Table 4.1: Diagnostic Test**

	<b>N</b>	<b>Skewness</b>		<b>Kurtosis</b>	
	<b>Statistic</b>	<b>Statistic</b>	<b>Std. Error</b>	<b>Statistic</b>	<b>Std. Error</b>
ROA	95	2.662	.247	2.056	.490
Total Commission to Total Market Revenue	95	.687	.247	.084	.490
No of Investors to Total Traders	95	2.229	.247	2.234	.490
Volume of Trade to Total Revenue	95	2.281	.247	1.477	.490
Firm Size	95	.344	.247	1.022	.490
Operational Cost Efficiency	95	2.469	.247	1.789	.490

Skewness is a measure of the symmetry in a distribution. A symmetrical dataset will have skewness equal to 0.30. On the other hand, Kurtosis is a measure of the combined sizes of the two tails. It measures the amount of probability in the tails. The value is often compared to the kurtosis of the normal distribution, which is equal to 3. If the kurtosis is greater than 3, then the dataset has heavier tails than a normal distribution (more in the tails). If the kurtosis is less than 3, then the dataset has lighter tails than a normal distribution (less in the tails).

From the findings, ROA had Skewness of 2.662 with Kurtosis of 2.056; total commission to total market revenue had Skewness of 0.687 with Kurtosis of 0.084, number of investors to total traders had Skewness of 2.229 and Kurtosis of 2.234, volume of trade to total

revenue had Skewness of 2.281 and Kurtosis of 1.477, firm size had Skewnes of 0.344 and Kurtosis of 1.022 and operational cost efficiency had Skewness of 2.469 and Kurtosis of 1.789.

## 4.2 Descriptive Statistics

Means and standard deviation forming descriptive analysis of the data are shown in Table 4.2.

**Table 4.2: Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Dev
ROA	95	.61	.92	.103	.511
Total Commission to Total Market Revenue	95	.01	1.00	.679	.218
No of Investors to Total Traders	95	.023	1.00	.174	.245
Volume of Trade to Total Revenue	95	0.11	1.03	.126	.225
Firm Size	95	3.68	9.35	6.607	1.578
Operational Cost Efficiency	95	.08	.74	.890	.065

The findings in Table 4.2 shows that ROA had a minimum value of .61 with maximum of 0.103, mean was 0.103 and standard deviation was 0.511, total commission to total market revenue had minimum value of 0.01 with maximum of 1.00, mean of 0.679 and standard deviation of 0.218. No of investors to total traders had minimum value of 0.023, maximum of 1.00, and mean of 0,174 and standard deviation of 0.245. Volume of trade to total

revenue had minimum of 0.11, maximum of 1.03, mean of 0.126 and standard deviation of 0.225. Firm size had minimum of 3.68, maximum of 9.35, mean of 6.607 and standard deviation of 1.578. Operational cost efficiency had a minimum of 0.08 with maximum of 0.74, mean of 0.890 and standard deviation of 0.065.

### **4.3 Correlation Analysis**

In order to establish the direction and strength of relationship between the study variables, the researcher conducted correlation analysis. The findings are shown in Table 4.3.

**Table 4.3: Correlation Analysis**

		<b>ROA</b>	<b>Total Commission to Total Market Revenue</b>	<b>No. of Investors to Total Traders</b>	<b>Volume of Trade to Total Revenue</b>	<b>Firm Size</b>	<b>Operational Cost Efficiency</b>
ROA	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	95					
Total Commission to Total Market Revenue	Pearson Correlation	.507	1				
	Sig. (2-tailed)	.000					
	N	95	95				
No. of Investors to Total Traders	Pearson Correlation	.320	-.881	1			
	Sig. (2-tailed)	.002	.000				
	N	95	95	95			
Volume of Trade to Total Revenue	Pearson Correlation	-.869	.642	-.367	1		
	Sig. (2-tailed)	.000	.000	.000			

	N	95	95	95	95		
Firm Size	Pearson Correlation	.552	-.940	.765**	-.666	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	95	95	95	95	95	
Operational Cost Efficiency	Pearson Correlation	-.156	.506	-.591	.129	-.334	1
	Sig. (2-tailed)	.130	.000	.000	.213	.001	
	N	95	95	95	95	95	95

Correlation analysis usually indicates the Pearson correlation  $r$  and the  $p$  values. The value of Pearson correlation can range from positive or negative and from 0 to 1. It can either be weak, moderate or strong based on 0-0.29, 0.3-0.49 and above 0.5 respectively. The  $p$  values indicate significance of the variables by comparing with 0.05.

From the findings, total commission to total market revenue had Pearson correlation  $r=0.507$ ,  $p=0.000<0.05$ . This shows there is strong positive correlation between total commission to total market revenue generated by stock brokerage firms and their performance. Number of investors to total traders had  $r=0.320$ ,  $p=0.002$ ; an indication of moderate relationship between the number of investors to total traders an performance of stock brokerage firms. For the volume of trade to total revenue generated,  $r=-0.869$ ,  $p=0.000$ ; which indicates strong negative correlation. This means that increase in volume of trade to total revenue generated reduces performance of stock brokerage firms.

For firm size,  $r=0.552$ ,  $p=0.000$ , an indication of strong positive relationship between size and performance of stock brokerage firms. It suggests that increase in size enhances performance of stock brokerage firms. According to (Knight, 1972), larger firms may have an added advantage over small firms to certain levels of operations.

Operational cost efficiency had  $r=-0.156$ ,  $p=0.130$ , which shows an inverse relationship between operational cost efficiency and performance of stock brokerage firms. This means that an increase in operational cost efficiency reduces performance of stock brokerage firms.

#### 4.4 Regression Analysis

The researcher conducted regression analysis to establish the effect of mobile banking on the performance of stock brokerage firms in Kenya. The findings of the Model summary, ANOVA and Regression coefficients are clearly indicated in subsequent Tables.

**Table 4.4: Model Summary**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.896	.802	.793	.23293

The Model Summary above indicates the coefficient of correlation  $R=.896$ , showing that the variables of the study had strong correlation positive with each other. The coefficient of determination R square is .802, showing that 80.2% variability in performance of stock brokerage firms is explained by the independent variables of the study (total Commission volume generated through mobile banking to total revenue of the market participant,

number of investors who traded via brokers using mobile banking to divided by the total number of traders who trade through the market participant, volume of trades moved using mobile banking per participant divided to the total revenue moved through all the trading platforms, firm size and operational cost efficiency).

**Table 4.5: ANOVA**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	19.771	5	3.954	72.879	.000b
Residual	4.829	89	.054		
<b>Total</b>	<b>24.600</b>	<b>94</b>			

From ANOVA findings, the value of F calculated is 72.879 while F critical is 2.474. As the value of F calculated is greater than F critical,  $72.879 > 2.474$ , this shows that the overall regression model was significant.

**Table 4. 6: Regression Coefficients**

	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	2.731	.716		3.814	.000
Total Commission to Total Market Revenue	2.533	.566	1.081	4.480	.000
No of Investors to Total Traders	.857	.262	.411	3.266	.002
Vol of Trade to Total Revenue	2.411	.167	1.064	14.403	.000
Firm Size	.159	.053	.491	3.016	.003
Operational Cost Efficiency	.013	.005	.159	2.485	.015

The resultant equation,

$$Y_t = 2.731 + 2.533X_{1t} + 0.857X_{2t} + 2.411X_{3t} + 0.159X_{4t} + 0.013X_{5t}$$

Where

Y= is Performance of brokerage firms

$$Y_t(ROA) = \frac{Net\ Income_t}{Total\ Assets_t}$$



$X_1$ =Total Commission volume generated through mobile banking, divided by the total revenue of the market participant

$X_2$ =Number of investors who traded via brokers using mobile banking, divided by the total number of traders who trade through the market participant

$X_3$ =volume of trades moved using mobile banking per participant divided by the total revenue moved through all the trading platforms

$X_4$ =the firm size or firm value taken as the price to earnings ratio of the firm

$X_5$ =the operational cost efficiency taken as the gross margin

Therefore, when all the study variables were to be held constant, performance of stock brokerage firms would at 2.731. A unit change in total Commission volume generated through mobile banking to total revenue of the market participant would result into 2.533 increases in performance of stock brokerage firms. A unit change in investors who traded via brokers using mobile banking to the total number of traders who trade through the market participant would result into 0.857 increases in performance of brokerage firms. A unit change in volume of trades moved using mobile banking per participant to the total revenue moved through all the trading platforms would lead to 2.471 increases in performance of brokerage firms. A unit change in firm size would lead to 0.159 changes in performance of brokerage firms. A unit change in operational cost efficiency would lead to 0.013 changes in performance of brokerage firms.

Based on significance at 0.05, the study established that the total commission volume generated through mobile banking to total revenue of the market participant had significant influence on performance of stock brokerage firms  $p=0.000<0.05$ . Investors who traded via brokers using mobile banking to the total number of traders who trade through the market participant was significant had significant effect on performance of stock brokerage firms  $p=0.002<0.05$ . Volume of trades moved using mobile banking per participant to the total revenue moved through all the trading platforms was significant determinant of performance of stock brokerage firms  $p=0.000<0.05$ . Firm size had significant effect on performance of stock brokerage firms  $p=0.003<0.05$ . Operational cost efficiency was another factor with significant effect on performance of stock brokerage firms  $p=0.015<0.05$ .

#### **4.5 Discussion of the Findings**

From both correlation and regression analysis, the total commission volume generated through mobile banking to total revenue of the market participant, investors who traded via brokers using mobile banking to the total number of traders who trade through the market participant, volume of trades moved using mobile banking per participant to the total revenue moved through all the trading platforms and firm size all had significant effect on performance of stock brokerage firms. Take for example the size of the firm, (Knight, 1972), indicated that it may have an influence of the economies of scale in that larger firms may find it easier and efficient in operations due to economies of scale or the fact that they can increase operations at a higher rate compared to how operating expenses rise to a certain production level.

Correlation analysis indicated inverse relationship between volumes of trades moved using mobile banking per participant to the total revenue moved through all the trading platforms and operational cost efficiency in relation to performance of stock brokerage firms. According to Donner and Tellez (2008), through offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, m-banking/m-payments systems could prove to be an important innovation for the developing world.

Correlation analysis and regression analysis disagreed on significance of operational cost efficiency, where according to regression, it was significant but in view of correlation analysis, the variable was insignificant. The correlation analysis result therefore contradicts with (Cornuejols & Tütüncü, 2007) who indicated that efficiency with which market participants operate in terms of cost saving and good information systems in the application of technology saves costs and increases the speed of operating therefore increasing performance by brokerage firms.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter contains a summary of the analyzed data in line with study objectives. The summarized findings are used to generate conclusions of the study. There are also recommendations of the study based on key findings that are relevant to policy makers. The chapter gives the limitations encountered by the researcher and how this was addressed besides suggestions for further researcher.

### **5.2 Summary of the Findings**

The main purpose of this study was to determine the impact of mobile banking on the performance of stock brokerage firms in Kenya. To achieve this objective, examined how (total Commission volume generated through mobile banking to total revenue of the market participant, number of investors who traded via brokers using mobile banking to divided by the total number of traders who trade through the market participant, volume of trades moved using mobile banking per participant divided to the total revenue moved through all the trading platforms, firm size and operational cost efficiency) affected performance of stock brokerage firms in Kenya. The findings are summarized in subsequent sections.

### **5.2.1 Total Commission Volume Generated through Mobile Banking to Total Revenue of Market Participant**

From descriptive analysis, total commission to total market revenue had minimum value of 0.01 with maximum of 1.00, mean of 0.679 and standard deviation of 0.218. Correlation analysis indicated that total commission to total market revenue had Pearson correlation  $r=0.507$ ,  $p=0.000<0.05$ . This shows there is strong positive correlation between total commission to total market revenue generated by stock brokerage firms and their performance. Based on regression analysis, the study established that the total commission volume generated through mobile banking to total revenue of the market participant had significant influence on performance of stock brokerage firms  $p=0.000<0.05$ .

### **5.2.2 Number of Investors who traded via Brokers using Mobile Banking to Total Number of Traders who Trade through Market Participant**

The findings of descriptive statistics indicated that number of investors to total traders had minimum value of 0.023, maximum of 1.00, and mean of 0,174 and standard deviation of 0.245. The findings of correlation analysis noted that the number of investors to total traders had  $r=0.320$ ,  $p=0.002$ ; an indication of moderate relationship between the number of investors to total traders and performance of stock brokerage firms. Regression analysis showed that investors who traded via brokers using mobile banking to the total number of traders who trade through the market participant was significant had significant effect on performance of stock brokerage firms  $p=0.002<0.05$ .

### **5.2.3 Volume of Trades Moved using Mobile Banking per Participant to Total Revenue Moved through all Trading Platforms**

Descriptive statistics showed that volume of trade to total revenue had minimum of 0.11, maximum of 1.03, mean of 0.126 and standard deviation of 0.225. The findings of correlation analysis indicated that  $r=-0.869$ ,  $p=0.000$ ; which implies strong negative correlation. This means that increase in volume of trade to total revenue generated reduces performance of stock brokerage firms. The findings of regression analysis revealed that the volume of trades moved using mobile banking per participant to the total revenue moved through all the trading platforms was significant determinant of performance of stock brokerage firms  $p=0.000<0.05$ .

### **5.2.4 Firm Size or Firm Value**

From descriptive statistics, firm size had minimum of 3.68, maximum of 9.35, mean of 6.607 and standard deviation of 1.578. Correlation analysis showed an  $r=0.552$ ,  $p=0.000$ , an indication of strong positive relationship between size and performance of stock brokerage firms. It suggests that increase in size enhances performance of stock brokerage firms. Based on regression analysis, the study established that firm size had significant effect on performance of stock brokerage firms  $p=0.003<0.05$ .

### **5.2.5 Operational Cost Efficiency**

Operational cost efficiency had a minimum of 0.08 with maximum of 0.74, mean of 0.890 and standard deviation of 0.065. Correlation analysis revealed that an  $r=-0.156$ ,  $p=0.130$ , which shows an inverse relationship between operational cost efficiency and performance

of stock brokerage firms. This means that an increase in operational cost efficiency reduces performance of stock brokerage firms. From regression analysis, operational cost efficiency had significant effect on performance of stock brokerage firms  $p=0.015<0.05$ .

### **5.3 Conclusion**

There was strong positive correlation between total commission volumes generated through mobile banking to total revenue of market participant and performance of stock brokerage firms. Total commission volumes generated through mobile banking to total revenue of market participant significantly affects performance of stock brokerage firms.

There is moderate positive relationship between the number of investors who traded via brokers using mobile banking to total number of traders who trade through market participant and performance of stock brokerage firms. The number of investors who traded via brokers using mobile banking to total number of traders who trade through market participant is a significant predictor of performance of stock brokerage firms.

There is strong negative correlation between volumes of trades moved using mobile banking per participant to total revenue moved through all trading platforms and performance of stock brokerage firms. Volumes of trades moved using mobile banking per participant to total revenue moved through all trading platforms is a significant predictor of performance of stock brokerage firms. There was strong positive relationship between firm size and performance of stock brokerage firms. Firm size had significant effect on performance of stock brokerage firms. There was an inverse relationship between operational cost efficiency and performance of stock brokerage firms as per the correlation

analysis. Operational cost efficiency was a significant determinant of performance of stock brokerage firms.

#### **5.4 Recommendations of the Study**

Top management of all stock brokerage firms operating in Kenya should come up with sustainable strategies geared towards growing of the total commission volumes generated through mobile banking and total revenue of market participant. The management of NSE should create awareness among market participants including investors to leverage on mobile banking in carrying out their transactions and this will enhance performance of stock brokerage firms.

The Capital Market Authority CMA in conjunction with the Central Bank of Kenya and Telecommunication firms like Safaricom need to cooperate in formulation of sound policies and regulations that shall grow volumes of trades moved using mobile banking per participant and total revenue moved through all trading platforms and this shall enhance performance of stock brokerage firms.

Stock brokerage firms need to align their growth strategy with the overall strategic goals of their organization in order to increase their sizes and this improves performance. Top management of all stock brokerage firms and all firms generally operating in Kenya and investors should adopt technology for example m-banking in carrying out their operations.

#### **5.5 Limitations of the Study**

One of the challenges faced by the researcher was collection of secondary data to gather all the 25 licensed stock brokerage firms in Kenya over a 5 year period 2012 to 2016. Some



stock brokerage firms had only been in operation for two years, while for others, data could not be sufficient. The researchers overcome this challenge by sampling out only firms that have had operations from 2012 below to 2016. Firms that had insufficient data were eliminated.

### **5.6 Suggestions for Further Research**

The current study focused on how mobile banking affected performance of stock brokerage firms in Kenya; future studies should examine how mobile banking and telephony has affected say listed banks. Listed financial firms at NSE or listed non-financial firms. Regression analysis indicated a coefficient of determination R square of 80.4%, implying that there are other factors affecting performance of stock brokerage firms in Kenya which the current study did not cover and this forms areas for further studies.

## REFERENCES

- (U.S.), P. C. (1986). *A Literature Review*. Washington D.C: The Commission.
- Alford, B. W., & (GB), E. h. (1975). *British Economic Performance : 1945-1975*.  
Cambridge: Cambridge University Press.
- Berger, A. N., & Udell, G. F. (2005). *A more complete conceptual framework for financing of small and medium enterprises*. Washington D.C: World Bank, Development Research Group, Finance Team.
- Bernardo, N. (2014). *Mobile Banking*. Basingstoke: Palgrave Macmillan.
- Bickman, L. (2000). *Research design*. Cambridge: Research design.
- Blumberg, B. F., Cooper, D. R., & Schindler, P. S. (2014). *Business Research Methods*.  
London: McGraw-Hill Education.
- Booz, A. &., & Support, U. S. (1985). *Review of transit data collection techniques : final report*. Washington D.C: Springfield.
- Capital Markets Authority. (2017, September 18). *Capital Markets Authority*. Retrieved from Capital Markets Authority: <https://www.cma.or.ke/index.php/regulatory-framework/regulations>
- Cornuejols, G., & Tütüncü, R. (2007). *Optimization Methods in Finance*. Cambridge: Cambridge University Press.

- Demirgüç-Kunt, A., & Levine, R. (1993). Stock Market Development and Financial Intermediary growth : a Research Agenda. *Stock Market Development*, 56-98.
- Elliott, B. (2017). *Financial Accounting and Reporting*. London: Pearson Education Limited.
- Exchange, N. S. (2017, September 18). *Market Participants*. Retrieved from Nairobi Securities Exchange: <https://www.nse.co.ke/member-firms/firms.html>
- Greenbaum, S. I., Thakor, A. V., & Boot, A. W. (2016). *Contemporary Financial Intermediation*. London: Elsevier/Academic Press.
- Kaplow, L. (2015). *Market Definition, Market Power*. Cambridge: Mass.
- Kettis, M., & institutionen, S. u. (2004). *The challenge of political risk : exploring the political risk management of Swedish multinational corporations*. Stockholm: Stockholm University, Department of Political Science.
- Kiarie, J., & Minja, D. (2014). *Corporate Governance and its Role in Mitigating Risks in Stock Brokerage Firms in Nairobi, Kenya*. Nairobi: The International Institute for Science, Technology and Education.
- Kulkarni, M. S. (1988). *Agency theory*. Hull: Barmarick Publications.
- Labonne, J., Chase, R. S., & Bank, W. (2009). *The Power of Information : the Impact of Mobile Phones On Farmers' Welfare In The Philippines*. Washington D.C: The World Bank.

- Laudon, K. C., & Traver, C. G. (2013). *E-commerce : Business, Technology, Society*. Boston: Pearson.
- Leiter, R. D. (1977). *Modern Economics*. New York: Barnes and Noble Books.
- Marketline. (2014). Mobile Banking Industry Profile: Spain. *Mobile Banking Industry Profile: Spain*, 43-87.
- Mayer, M. (1992). *Stealing the market : how the giant brokerage firms, with help from the SEC, stole the stock market from investors*. New York: Basic Books.
- Mishkin, F. S., & Serletis, A. (2016). *The Economics of Money, Banking, and Financial Markets*. Toronto: Pearson.
- Nicoletti, B. (2014). *Mobile banking : evolution or revolution?* Basingstoke: Palgrave Macmillan.
- Norman, D. J. (2002). *Professional electronic trading*. New York: Wiley.
- Palepu, K. G., Healy, P. M., & Peek, E. (2016). *Business analysis and valuation : IFRS edition*. Hampshire: Cengage Learning EMEA.
- Ratner, N. B., & Healey, E. C. (1999). *Stuttering research and practice : bridging the gap*. New Jersey: Erlbaum.
- Read, C. (2013). *The Efficient Market Hypothesis*. New York: Houndmills.
- Ryan, T. P. (2009). *Modern Regression Methods*. New York: Wiley.

Sales, R. (2003). *Technology in Finance*. London: Euromoney Institutional Investor PLC.

Scheaffer, R. L. (2012). *Elementary Survey Sampling*. Boston: Brooks/Cole.

Shiller, R. J. (2001). *Market Volatility*. Cambridge: MIT Press.

Shneiderman, B., Plaisant, C., Cohen, M., Jacobs, S., & Elmqvist, N. (2017). *Designing the user interface : strategies for effective human-computer interaction*. Boston: Pearson.

Weiss Ratings, I. (2001). *Weiss ratings' guide to brokerage firms : a quarterly compilation of ratings and analysis covering the major U.S. stock brokers*. Florida: Weiss Ratings.

## APPENDIX I: LIST OF LICENSED MARKET PARTICIPANTS

	<b>List of Licensed Market Participants as of December 2016</b>
1	Dyer & Blair Investment Bank Ltd
2	Francis Drummond & Company Limited
3	NgenyeKariuki& Co. Ltd. ( Under Statutory Management)
4	Suntra Investment Bank Ltd
5	Old Mutual Securities Ltd
6	SBG Securities Ltd
7	Kingdom Securities Ltd
8	AIB CAPITAL LTD
9	ABC Capital Ltd
10	Sterling Capital Ltd
11	Apex Africa Capital Ltd
12	Faida Investment Bank Ltd
13	NIC Securities Limited
14	Standard Investment Bank Ltd
15	Kestrel Capital (EA) Limited
16	African Alliance Securities
17	Renaissance Capital (Kenya) Ltd
18	Genghis Capital Ltd
19	CBA Capital Ltd
20	Equity Investment Bank Limited

21	KCB Capital
22	Barclays Financial Services Limited
23	Securities Africa Kenya Limited
24	EFG Hermes Kenya Limited

**APPENDIX II: DATA FOR THE STUDY**

<b>ROA</b>	<b>XI</b>	<b>X2</b>	<b>X3</b>	<b>X4-SIZE</b>	<b>X5-Operational Cost Efficiency</b>
-1.33244	0.449679	0.201677	0.185531	4.03277988	1.063332811
-1.12691	0.317529	0.00543	0.219226	3.72386596	0.857039292
-1.1806	0.616147	0.12286	0.159995	3.99149189	0.657162212
-0.81965	0.778288	0.00652	0.144101	3.70148164	0.487790135
-0.56804	0.57164	0.080209	0.06822	3.98842517	0.208671057
0.054093	0.402971	0.126574	0.02225	3.68349732	0.019718873
-0.99174	0.775149	0.089357	0.056013	6.9692761	0.366928467
-3.61387	0.836189	0.010854	0.149912	6.80543289	1.967345837
-0.93206	0.768735	1	0.068399	6.53147892	0.286402035
-2.16159	0.849841	0.001165	0.121587	6.29402509	1.921904762
-0.08393	0.486183	0.000501	0.0023	5.83688087	0.208907152
-0.05714	0.481292	7.28E-05	0.001261	5.77240973	0.305717959
0.152714	0.487817	0.020392	0.014257	5.83688087	0.249913633
0.012227	0.585035	0.062832	0.003497	5.89324507	0.113320957
-0.0104	0.669278	0.005021	0.012088	5.92542916	0.00993497
0.001555	0.730952	0.003363	0.027388	5.97458307	0.019357412
0.064602	0.781065	0.009371	0.014711	5.99923932	0.342720722
0.131319	0.736156	0.00453	0.015424	5.91135899	0.328308889
0.151986	0.619309	0.002818	0.008652	5.91346787	0.287056022



-0.14849	0.619031	0.001359	0.047414	5.89911927	0.242977805
0.18841	0.605828	0.009204	0.03835	8.18515084	0.197755579
0.004246	0.853286	0.021549	0.008598	8.00639463	0.009937342
0.315403	0.565922	0.013158	0.00239	8.25271697	0.377550831
0.012077	0.814377	0.042582	0.003464	8.15844339	0.03745815
0.027704	0.92423	0.010405	0.005151	8.61987643	0.09418
-0.10567	0.818035	0.176753	0.008436	8.57926926	0.965057884
-0.01253	0.775111	0.222505	0.007717	8.67716692	0.218975687
0.030814	0.576256	0.412053	0.011609	8.57817408	0.218947237
0.023722	0.60561	0.404663	0.012727	8.62787198	0.333561522
0.300374	0.372597	0.105129	0.00322	8.74268668	0.725467679
-0.01136	0.75895	0.004081	0.008722	5.81175726	0.011509121
0.216214	0.665879	0.042891	0.179247	6.00080617	0.462837071
0.105911	0.655771	0.0521	0.254508	6.09568009	0.517883902
0.160574	0.752229	0.061887	0.012457	6.1706266	0.583318853
0.103052	0.845123	0.013746	0.010227	6.12891953	0.59465098
0.02462	0.368492	0.144824	0.076191	9.30281064	0.183064899
-0.01607	0.491554	0.035137	0.037245	9.1746073	0.234872001
0.000973	0.458761	0.14422	0.054051	9.27311415	0.159862881
0.018011	0.688464	0.097683	0.013201	9.31719329	0.196803768
0.079811	0.578271	0.134722	0.029733	9.34846945	0.303444454
-0.00183	0.304652	0.967346	0.032654	5.42762728	0.02289532

0.010859	0.185577	1	0.00435	5.41677194	0.330865001
0.011719	0.292193	0.879074	0.120926	5.41052755	0.239603087
0.002556	0.009995	0.965642	0.00321	5.41192091	0.106690778
-0.00133	0.111124	0.789227	0.00564	5.40271006	0.019567959
0.011014	0.985567	0.011633	0.0028	8.79932671	0.10526477
0.033457	0.770883	0.138107	0.004485	8.79154816	0.136081214
0.0266	0.916472	0.077501	0.006027	8.80178138	0.209591409
0.06387	0.905845	0.0847	0.006832	8.81630621	0.257338392
0.007436	0.996008	0.001168	0.002824	8.88087953	0.1189851
0.049309	1	0.25	0.336395	4.76976861	0.585097375
-0.03994	1	0.096588	0.787402	4.79759297	1.921779141
-0.04907	1	0.068398	0.372232	4.79429979	16.79139073
-0.05561	1	0.040502	0.330178	4.79429979	53.08333333
-0.12505	1	0.053146	0.253421	4.8697127	20.28043143
0.01763	0.48215	0.51785	0.625775	5.67161247	0.374224585
0.005966	0.261987	0.738013	0.907605	5.62591511	0.092395205
0.017149	0.482692	0.517308	0.64985	5.63581537	0.350150428
-0.00199	0.413352	0.586648	1.02635	5.49134068	-0.026349711
-0.06477	0.611381	0.10966	0.041856	5.45462842	-0.325972031
0.0039	0.584724	0.123421	0.026771	5.53606706	0.020974362
0.007973	0.676444	0.076599	0.000339	5.51652612	0.110627072
0.018662	0.80054	0.065634	0.034167	5.72493419	0.26772273

0.028155	0.780778	0.06607	0.0465	5.72070163	0.232689614
0.027683	0.692282	0.044081	0.00651	5.66107878	0.238271647
-0.01745	0.793234	0.25242	0.041812	5.85435828	0.381707233
-0.00066	0.853597	0.161298	0.040924	5.86692443	0.02243039
0.004344	0.78472	0.178099	0.11095	5.87033893	0.134018517
0.012015	0.927611	0.070135	0.037776	5.8679516	0.147743459
0.022536	0.91052	0.072918	0.00761	5.86978656	0.515071688
0.152478	0.378949	0.142454	0.478598	5.71837545	0.461158237
0.038997	0.751933	0.217605	0.030463	5.71798322	0.23938012
0.016894	0.817622	0.168605	0.013773	5.81035822	0.269157749
0.106695	0.861066	0.097903	0.041031	5.71603341	0.499328488
0.029821	0.879745	0.112409	0.007846	5.751877	0.402522878
0.076035	0.684679	0.12032	0.006416	6.20179409	0.448660592
0.018395	0.783013	0.00871	0.014545	6.14832928	0.209033352
0.126156	0.564419	0.108178	0.003381	6.17222889	0.431893412
0.110726	0.529259	0.045735	0.0872	6.21414152	0.615836496
0.011424	0.611	0.105382	0.003332	6.13423737	0.124104543
0.008794	0.721819	0.278181	0.506635	6.12028793	0.117830659
0.007218	0.884444	0.115556	0.674136	6.33747923	0.069546868
0.021027	0.907466	0.092534	0.675799	6.07194126	0.097404534
0.015416	0.913993	0.086007	0.674233	6.04515823	0.136674023
0.019189	0.949388	0.0761	0.618674	6.02449182	0.096465591

0.007062	0.842463	0.143264	0.00378	8.57929647	0.104771412
0.031939	0.805452	0.150527	0.037442	8.67041271	0.388883686
0.034915	0.823182	0.132156	0.026798	8.6584607	0.281249123
0.045218	0.871345	0.094777	0.002881	8.69774602	0.25524304
0.012337	0.893169	0.07842	0.028411	8.6441781	0.224894958
0.004022	0.463212	0.002547	0.05684	8.79047503	0.116382852
0.01699	0.631332	0.163807	0.025805	8.80284884	0.195796926
0.00495	0.813207	0.072554	0.022602	8.78563009	0.154203694
0.177613	0.336155	0.643784	0.004863	8.8400607	0.737810034
0.054671	0.512213	0.434509	0.007204	8.73746033	0.606490244